No. 9600052

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Pioneer Hi-Bred International, Inc.

WHEREAS, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF EIGHTEEN YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

SOYBEAN

'9151'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this thirty-first day of March in the year of our Lord one thousand nine hundred and ninety-eight.

Attest:

Acting Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

REPRODUCE LOCALLY. *Include form number and date on all reproductions.*

FORM APPROVED - OMB NO. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE DIVISION - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a).

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) *(as it is to appear on the Certificate)*
Pioneer Hi-Bred International, Inc.

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER

3. VARIETY NAME
9151

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*
700 Capital Square
400 Locust St.
Des Moines, IA 50309

5. TELEPHONE *(include area code)*
515/270-3582

6. FAX *(include area code)*
515/253-2288

FOR OFFICIAL USE ONLY

PVPO NUMBER
9600052

FILING DATE
NOV 22, 1995

FEES RECEIVED
FILING AND EXAMINATION FEE: $ 2450 00
DATE NOV 22 1995
CERTIFICATION FEE: $ 300
DATE 3/20/1996

7. GENUS AND SPECIES NAME
Glycine Max

8. FAMILY NAME *(Botanical)*
Leguminosae

9. CROP KIND NAME *(Common name)*
Soybean

10. IF THE APPLICANT NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION *(corporation, partnership, association, etc.) (Common name)*
Corporation

11. IF INCORPORATED, GIVE STATE OF INCORPORATION
Iowa

12. DATE OF INCORPORATION
1926

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS
John Grace
7300 NW 62nd Ave.
PO Box 1004
Johnston, IA 50131-1004

Mike Roth (copy)
700 Capital Square
400 Locust St.
Des Moines, IA 50309

14. TELEPHONE *(include area code)*
515/270-3582

15. FAX *(include area code)*
515/253-2288

16. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED *(Follow instructions on reverse)*

a. ☒ Exhibit A. Origin and Breeding History of the Variety
b. ☒ Exhibit B. Statement of Distinctness
c. ☒ Exhibit C. Objective Description of the Variety
d. ☒ Exhibit D. Additional Description of the Variety
e. ☒ Exhibit E. Statement of the Basis of the Applicant's Ownership
f. ☒ Voucher Sample *(2,500 viable untreated seeds or, for tuber propagated varieties verification that tissue culture will be deposited and maintained in a public repository)*
g. ☒ Filing and Examination Fee ($2,450), made payable to "Treasurer of the United States" *(Mail to PVPO)*

17. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY, AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act)?*
☐ YES *(If "yes," answer items 18 and 19 below)* ☒ NO *(If "no," go to item 20)*

18. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☐ YES ☐ NO

19. IF "YES" TO ITEM 18, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

20. HAS THE VARIETY OR A HYBRID PRODUCED FROM THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?
☐ YES *(If "yes," give names of countries and dates)* ☒ NO

21. The applicant(s) declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.

The undersigned applicant(s) is(are) the owner(s) of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Applicant(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT *(Owner(s))*
D. John Grace, III

NAME *(Please print or type)*
D. John Grace III

CAPACITY OR TITLE
Soybean Research Coordinator

DATE
11/16/95

SIGNATURE OF APPLICANT *(Owner(s))*

NAME *(Please print or type)*

CAPACITY OR TITLE

DATE

SD-470 (04-95) *(Previous editions are to be destroyed)*

(See reverse for instructions and information collection burden statement)

Pioneer Hi-Bred Int'l, Inc.
PVP Application 9151 Soybean
May 2, 1995

EXHIBIT A

ORIGIN AND BREEDING HISTORY

Breeding History of 9151 Soybean

1988 (Summer) A cross was made between 'Elgin 87' and '9162' at the Pioneer research station in Redwood Falls, Minnesota. The stock number "10215" was assigned to identify the population created by this cross.

1988-90 Population 10215 was advanced through the F4 generation using modified single seed descent.

1990 F5 generation of population 10215 was grown in Redwood Falls, Minnesota. Single plants were selected from this population and individually threshed. Seed from one of these harvested plants was composited to form the line designated 10215-036.

1991 10215-036 was entered into a preliminary yield trial (Test: RFH10600).

1992 10215-036 entered an advanced yield trial in Minnesota (test: RFA1B400). Plants were pulled from a rouged bulk for purification purposes.

1993 Entered into elite yield trials across the Group I growing regions of the United States and Canada (Tests: RFA1L000, NPA1L000). One hundred forty four purification rows derived from plants pulled in 1992 were harvested and bulked to form the first breeder seed lot. Rows containing offtypes were rouged or discarded

1993 (Winter) A 5 acre breeder seed increase was produced in Santiago, Chile from purification rows grown during the summer of 1993.

1994 Second year of elite yield testing across the United States and Canada (Tests: RFA1L000, NPA1L000, RFVXB16D). A 126 acre production block (foundation seed) was grown in Waterloo, Iowa.

1995 Based on superior yield for maturity, multi-race Phytophthora resistance, and strong iron-deficiency chlorosis tolerance, the line was released as '9151'.

'9151' has undergone four years of extensive testing and purification. It has been observed by the breeder to be uniform and stable for all plant traits from generation to generation, with no evidence of variants.

Five acres of 9151 (breeder's seed) were grown during the winter of 1993-94. One hundred twenty-six acres of 9151 (foundation seed equivalent) were grown in 1994.

Pioneer Hi-Bred Int'l, Inc.
PVP Application 9151 Soybean
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EXHIBIT B: NOVELTY STATEMENT CONCERNING 9151 SOYBEAN

To our knowledge, variety 9151 is most similar to '9172' (PVP applied for concurrently), 'A1662', 'A1900', 'A2234', 'A2506', 'A2543', 'Elgin 87', 'L2233', 'L2556', and '9231'. However, all lines display different isozyme patterns (Table 1).

Table 1. Isozyme Profiles of 9151, 9172, A1662, A1900, A2234. A2506, A2543, Elgin 87, L2233, L2556, and 9231.

	Isozyme											
Variety	ACO2	ACO3	ACO4	ACP	DIA	ENP	IDH1	IDH2	MDH	MPI	PGM1	PHI1
9151	2	1	1,3	A	B	A	1,2	1	B	A	2	2
9172	2	1	1	A	B	A	1,2	1	B	A	1	1
9231	1	1	2	A	A	A	2	1,2	A	A	1	1
A1662	2	1	1,3	A	B	A	1	2	B	A	1	1
A1900	2	1	3	A	B	A	2	2	A	A	2	1
A2234	2	1	3	A	B	A	1	2	A	A	1	2
A2506	1	1	1	A	A	A	2	1	B	A	2	1
A2543	1	1	1,3	A	B	A	2	2	A	A	1	1
Elgin 87	2	1	3	A	B	A	2	1	B	A	2	1,2
L2233	2	1	3	A	B	A	2	2	A	A	1	1
L2556	2	1	1	A	B	A	2	2	A	A	1	1

Key:

Aconitase: ACO2, ACO3, ACO4
Acid Phosphatase: ACP
Diaphorase: DIA
Endopeptidase: ENP
Isocitrate Dehydrogenase: IDH1, IDH2
Malate Dehydrogenase: MDH
Mannose 6-Phosphate Isomerase: MPI
Phosphoglucomutase: PGM
Phosphoglucose Isomerase: PHI
□

Pioneer Hi-Bred Int'l, Inc.
PVP Application 9151 Soybean
May 2, 1995

EXHIBIT B: NOVELTY STATEMENT CONCERNING 9151 SOYBEAN

(continued)

Other significant differences between 9151 and the comparison varieties include:

A1662: A1662 is significantly taller than 9151 (Table 2).

A1900: A1900 has significantly smaller seed size than 9151 (Table 3).

A2234: A2234 is significantly taller than 9151 (Table 4).

A2506: A2506 matures 10 days later than 9151 (Table 5).

A2543: A2543 matures 12 days later than 9151 (Table 6).

Elgin 87: Elgin 87 has significantly smaller seed size than 9151 (Table 7).

Pioneer Hi-Bred Int'l Inc,
PVP Application 9151 Soybean
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Table 2. T-test comparison of 9151 vs. A1662 for plant height. Height is defined as the distance (in cm) from the soil surface to the topmost pod. Plots were four 30 inch rows wide and approximately 15 feet long.

YEAR	LOC	REP	A1662 (X1)	9151 (X2)	X1-X2	$(X1-X2)^2$
			---- plant height (cm) -----			
1994	105A	1	99	81	18	324
1994	105A	2	101	91	10	100
1994	105A	3	104	86	18	324
1994	105A	4	99	86	13	169
1994	106D	1	91	81	10	100
1994	106D	2	86	81	5	25
1994	106D	3	86	78	8	64
1994	106D	4	101	81	20	400
1994	108B	1	76	71	5	25
1994	108B	2	71	66	5	25
1994	108B	3	81	66	15	225
1994	108B	4	71	66	5	25
1994	346B	1	84	81	3	9
1994	359A	1	99	84	15	225
1994	359A	2	97	84	13	169
1994	359A	3	104	76	28	784
1994	359A	4	104	79	25	625
1994	361A	1	91	56	35	1225
1994	361A	2	102	56	46	2116
1994	361A	3	84	76	8	64
1994	361A	4	89	69	20	400
1994	901E	1	94	89	5	25
1994	901E	2	97	79	18	324
		SUM	2111	1763	348	7772
		MEAN	91.8	76.7	15.1	= **d**

Ave X1 =	91.8	
Ave X2 =	76.7	
d = (Ave X1 - Ave X2)	15.1	
n =	23	groups of individuals
SE diff = SQRT of	4.954	
SE diff =	2.226	
t = d/SE diff =	6.798	
df =	22	
Prob > **t** =	0.00000079	

$$\textbf{SE diff} = \sqrt{\frac{\Sigma (X1-X2)^2 - (\Sigma X1-X2)^2/n}{(n)(n-1)}}$$

$$\textbf{SE diff} = \sqrt{\frac{7772 - ((348)^2/23)}{(23)(22)}}$$

Location Key:

105A: Wood Lake, Minnesota
106D : Redwood Falls, Minnesota
108B: Pipestone, Minnesota
346B: Napoleon, Ohio
359A: Chatham, Ontario CANADA
361A: Glencoe, Ontario CANADA
901E: Johnston, Iowa

T3. 9151 v A1900 (Seed Size)

Pioneer Hi-Bred Int'l Inc,
PVP Application 9151 Soybean
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Table 3. T-test comparison of 9151 vs. A1900 for seed size.

YEAR	LOC	REP	9151 (X1)	A1900 (X2)	X1-X2	$(X1-X2)^2$
			- seed size (g/ 100 seeds) -			
1994	105A	1	19.0	17.5	1.5	2.25
1994	105A	2	20.5	16.5	4.0	16.00
1994	105A	3	20.0	18.5	1.5	2.25
1994	105A	4	19.5	16.5	3.0	9.00
1994	106D	1	20.5	17.0	3.5	12.25
1994	106D	2	21.5	18.5	3.0	9.00
1994	106D	3	21.0	18.0	3.0	9.00
1994	106D	4	21.5	18.0	3.5	12.25
1994	108B	1	20.0	16.5	3.5	12.25
1994	108B	2	20.5	17.5	3.0	9.00
1994	108B	3	20.5	16.5	4.0	16.00
1994	108B	4	20.5	17.0	3.5	12.25
		SUM	245.0	208.0	37.0	121.50
		MEAN	20.42	17.33	3.08	= **d**

Location Key:

105A: Wood Lake, Minnesota
106D : Redwood Falls, Minnesota
108B: Pipestone, Minnesota

Ave X1 =	20.42
Ave X2 =	17.33
d = (Ave X1 - Ave X2)	3.08
n =	12 groups of individuals

$$\textbf{SE diff} = \sqrt{\frac{\Sigma (X1-X2)^2 - (\Sigma X1-X2)^2/n}{(n)(n-1)}}$$

$$\textbf{SE diff} = \sqrt{\frac{121.5 - ((37)^2/12)}{(12)(11)}}$$

SE diff = SQRT of	0.056
SE diff =	0.237
t = d/SE diff =	13.008
df =	11
Prob > **t** =	0.00000005

Pioneer Hi-Bred Int'l Inc,
PVP Application 9151 Soybean
May 2, 1995

Table 4. T-test comparison of 9151 vs. A2234 for plant height. Height is defined as the distance (in cm) from the soil surface to the topmost pod. Plots were four 30 inch rows wide and approximately 15 feet long.

YEAR	LOC	REP	A2234 (X1)	9151 (X2)	X1-X2	$(X1-X2)^2$
			---- plant height (cm) -----			
1994	105A	1	97	81	16	256
1994	105A	2	104	91	13	169
1994	105A	3	104	86	18	324
1994	105A	4	104	86	18	324
1994	106D	1	97	81	16	256
1994	106D	2	97	81	16	256
1994	106D	3	101	78	23	529
1994	106D	4	97	81	16	256
1994	108B	1	71	71	0	0
1994	108B	2	76	66	10	100
1994	108B	3	76	66	10	100
1994	108B	4	76	66	10	100
		SUM	1100	934	166	2670
		MEAN	91.7	77.8	13.8	= **d**

Ave X1 =	91.7	
Ave X2 =	77.8	
d = (Ave X1 - Ave X2)	13.8	
n =	12	groups of individuals

$$\textbf{SE diff} = \sqrt{\frac{\Sigma (X1-X2)^2 - (\Sigma X1-X2)^2/n}{(n)(n-1)}}$$

$$\textbf{SE diff} = \sqrt{\frac{2670 - ((166)^2/12)}{(12)(11)}}$$

SE diff = SQRT of	2.831
SE diff =	1.683
t = d/SE diff =	8.222
df =	11
Prob > **t** =	0.00000503

Location Key:

105A: Wood Lake, Minnesota
106D : Redwood Falls, Minnesota
108B: Pipestone, Minnesota

Pioneer Hi-Bred Int'l Inc,
PVP Application 9151 Soybean
May 2, 1995

Table 5. T-test comparison of 9151 versus A2506 for days to maturity. Days to Maturity is defined as the number of days from planting until 95% of the pods in the plots are physiologically mature. Plots were four 30 inch rows wide and approximately 15 feet long.

YEAR	LOC	REP	A2506 (X1)	9151 (X2)	X1-X2	$(X1-X2)^2$
			--- days to maturity ---			
1994	106D	1	144	129	15	225
1994	106D	2	143	127	16	256
1994	106D	3	143	128	15	225
1994	106D	4	144	135	9	81
1994	108B	1	137	131	6	36
1994	108B	2	142	133	9	81
1994	108B	3	141	131	10	100
1994	108B	4	139	134	5	25
		SUM	1133	1048	85	1029
		MEAN	141.6	131.0	10.6	= **d**

Ave X1 =	141.6
Ave X2 =	131.0
d = (Ave X1 - Ave X2	10.6
n =	8 groups of individuals

$$\textbf{SE diff} = \sqrt{\frac{\Sigma (X1-X2)^2 - (\Sigma X1-X2)^2/n}{(n)(n-1)}}$$

$$\textbf{SE diff} = \sqrt{\frac{1029 - ((85)^2/8)}{(8)(7)}}$$

Location Key:

106D : Redwood Falls, Minnesota
108B: Pipestone, Minnesota

SE diff = SQRT of	2.248
SE diff =	1.499
t = d/SE diff =	7.087
df =	7
Prob > **t** =	0.0001959

Pioneer Hi-Bred Int'l Inc.
PVP Application 9151 Soybean
May 2, 1995

Table 6. T-test comparison of 9151 versus A2543 for days to maturity. Days of Maturity is defined as the number of days from planting until 95% of the pods in the plot are physiologically mature. Plots were four 30 inch rows wide and approximately 15 feet long.

YEAR	LOC	REP	A2543 (X1)	9151 (X2)	X1-X2	$(X1-X2)^2$
			--- days to maturity ---			
1994	106D	1	143	129	14	196
1994	106D	2	143	127	16	256
1994	106D	3	147	128	19	361
1994	106D	4	144	135	9	81
1994	108B	1	141	131	10	100
1994	108B	2	142	133	9	81
1994	108B	3	143	131	12	144
1994	108B	4	143	134	9	81
		SUM	1146	1048	98	1300
		MEAN	143.3	131.0	12.3	= **d**

Location Key:

106D : Redwood Falls, Minnesota
108B: Pipestone, Minnesota

Ave X1 =	143.3	
Ave X2 =	131.0	
d = (Ave X1 - Ave X2	12.3	
n =	8	groups of individuals

$$\textbf{SE diff} = \sqrt{\frac{\Sigma (X1-X2)^2 - (\Sigma X1-X2)^2/n}{(n)(n-1)}}$$

$$\textbf{SE diff} = \sqrt{\frac{1300 - ((98)^2/8)}{(8)(7)}}$$

SE diff = SQRT of	1.777
SE diff =	1.333
t = d/SE diff =	9.190
df =	7
Prob > **t** =	0.0000372

Pioneer Hi-Bred Int'l Inc,
PVP Application 9151 Soybean
May 2, 1995

Table 7. T-test comparison of 9151 vs. Elgin 87 for seed size.

YEAR	LOC	REP	9151 (X1)	Elgin 87 (X2)	X1-X2	$(X1-X2)^2$
			- seed size (g/100 seeds) -			
1994	105A	1	19.0	19.0	0.0	0.00
1994	105A	2	20.5	19.0	1.5	2.25
1994	105A	3	20.0	19.0	1.0	1.00
1994	105A	4	19.5	19.0	0.5	0.25
1994	106D	1	20.5	19.5	1.0	1.00
1994	106D	2	21.5	18.5	3.0	9.00
1994	106D	3	21.0	20.5	0.5	0.25
1994	106D	4	21.5	19.5	2.0	4.00
1994	108B	1	20.0	19.0	1.0	1.00
1994	108B	2	20.5	19.0	1.5	2.25
1994	108B	3	20.5	19.5	1.0	1.00
1994	108B	4	20.5	18.5	2.0	4.00
		SUM	245.0	230.0	15.0	26.00
		MEAN	20.42	19.17	1.25	= **d**

Ave X1 =	20.42
Ave X2 =	19.17
d = (Ave X1 - Ave X2	1.25
n =	12 groups of individuals

$$\textbf{SE diff} = \sqrt{\frac{\Sigma (X1-X2)^2 - (\Sigma X1-X2)^2/n}{(n)(n-1)}}$$

$$\textbf{SE diff} = \sqrt{\frac{26.0 - ((15.0)^2/12)}{(12)(11)}}$$

Location Key:

105A: Wood Lake, Minnesota
106D : Redwood Falls, Minnesota
108B: Pipestone, Minnesota

SE diff = SQRT of	0.055
SE diff =	0.234
t = d/SE diff =	5.334
df =	11
Prob > **t** =	0.000240

FORM APPROVED: OMB NO. 0581-005

EXHIBIT (Soybean)

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
~~LIVESTOCK, MEAT, GRAIN~~ & SEED DIVISION
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MARYLAND 20705

OBJECTIVE DESCRIPTION OF VARIETY
SOYBEAN (Glycine max L.)

NAME OF APPLICANT(S)	TEMPORARY DESIGNATION	VARIETY NAME
Pioneer Hi-Bred International, Inc.		9151

ADDRESS *(Street and No., or R.F.D. No., City, State, and Zip Code)*
700 Capital Square
400 Locust Street
Des Moines, IA 50309

FOR OFFICIAL USE ONLY
PVPO NUMBER
9600052

Choose the appropriate response which characterizes the variety in the features described below. When the number of significant digits in your answer is fewer than the number of boxes provided, place a zero in the first box when number is 9 or less (e.g., [0][9]). Starred characters ★ are considered fundamental to an adequate soybean variety description. Other characters should be described when information is available.

1. SEED SHAPE:

[2]

1 = Spherical (L/W, L/T, and T/W ratios = < 1.2)
2 = Spherical Flattened (L/W ratio > 1.2; L/T ratio = < 1.2)
3 = Elongate (L/T ratio > 1.2; T/W = < 1.2)
4 = Elongate Flattened (L/T ratio > 1.2; T/W > 1.2)

★ **2. SEED COAT COLOR: (Mature Seed)**

[1] 1 = Yellow 2 = Green 3 = Brown 4 = Black 5 = Other *(Specify)* _____

3. SEED COAT LUSTER: (Mature Hand Shelled Seed)

[1] 1 = Dull ('Corsoy 79'; 'Braxton') 2 = Shiny ('Nebsoy'; 'Gasoy 17')

★ **4. SEED SIZE: (Mature Seed)**

[2][0] Grams per 100 seeds

★ **5. HILUM COLOR: (Mature Seed)**

[6] 1 = Buff 2 = Yellow 3 = Brown 4 = Gray 5 = Imperfect Black 6 = Black 7 = Other *(Specify)* _____

★ **6. COTYLEDON COLOR: (Mature Seed)**

[1] 1 = Yellow 2 = Green

★ **7. SEED PROTEIN PEROXIDASE ACTIVITY:**

[2] 1 = Low 2 = High

★ **8. SEED PROTEIN ELECTROPHORETIC BAND:**

[ ] 1 = Type A ($SP1^a$) 2 = Type B ($SP1^b$)

★ **9. HYPOCOTYL COLOR:**

[4] 1 = Green only ('Evans'; 'Davis') 2 = Green with bronze band below cotyledons ('Woodworth'; 'Tracy')
3 = Light Purple below cotyledons ('Beeson'; 'Pickett 71')
4 = Dark Purple extending to unifoliate leaves ('Hodgson'; 'Coker Hampton 266A')

★ **10. LEAFLET SHAPE:**

[3] 1 = Lanceolate 2 = Oval 3 = Ovate 4 = Other *(Specify)* _____

9600052

11. LEAFLET SIZE:

[2] 1 = Small ('Amsoy 71'; 'A5312') 2 = Medium ('Corsoy 79'; 'Gasoy 17') 3 = Large ('Crawford'; 'Tracy')

12. LEAF COLOR:

[2] 1 = Light Green ('Weber'; 'York') 2 = Medium Green ('Corsoy 79'; 'Braxton') 3 = Dark Green ('Gnome'; 'Tracy')

13. FLOWER COLOR:

[2] 1 = White 2 = Purple 3 = White with purple throat

14. POD COLOR:

[2] 1 = Tan 2 = Brown 3 = Black

15. PLANT PUBESCENCE COLOR:

[2] 1 = Gray 2 = Brown (Tawny)

16. PLANT TYPES:

[2] 1 = Slender ('Essex'; 'Amsoy 71') 2 = Intermediate ('Amcor'; 'Braxton') 3 = Bushy ('Gnome'; 'Govan')

17. PLANT HABIT:

[3] 1 = Determinate ('Gnome'; 'Braxton') 2 = Semi-Determinate ('Will') 3 = Indeterminate ('Nebsoy'; 'Improved Pelican')

18. MATURITY GROUP:

[0][4] 1 = 000 2 = 00 3 = 0 4 = I 5 = II 6 = III 7 = IV 8 = V 9 = VI 10 = VII 11 = VIII 12 = IX 13 = X

19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

BACTERIAL DISEASES:

★ [0] Bacterial Pustule *(Xanthomonas phaseoli* var. *sojensis)*

★ [1] Bacterial Blight *(Pseudomonas glycinea)*

★ [0] Wildfire *(Pseudomonas tabaci)*

FUNGAL DISEASES:

★ [1] Brown Spot *(Septoria glycines)*

Frogeye Leaf Spot *(Cercospora sojina)*

★ [0] Race 1 [0] Race 2 [0] Race 3 [0] Race 4 [0] Race 5 [ ] Other *(Specify)*

[0] Target Spot *(Corynespora cassiicola)*

[0] Downy Mildew *(Peronospora trifoliorum* var. *manshurica)*

[0] Powdery Mildew *(Microsphaera diffusa)*

★ [1] Brown Stem Rot *(Cephalosporium gregatum)* Moderately Resistant

[0] Stem Canker *(Diaporthe phaseolorum* var. *caulivora)*

19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant) (Continued)

FUNGAL DISEASES: (Continued)

★ [1] Pod and Stem Blight *(Diaporthe phaseolorum* var; *sojae)*

[1] Purple Seed Stain *(Cercospora kikuchii)*

[1] Rhizoctonia Root Rot *(Rhizoctonia solani)*

Phytophthora Rot *(Phytophthora megasperma* var. *sojae)*

★ [2] Race 1 [2] Race 2 [2] Race 3 [0] Race 4 [2] Race 5 [0] Race 6 [2] Race 7

[0] Race 8 [2] Race 9 [2] Other *(Specify)* 10, 13, 17; susceptible to races 12,16 & 19

VIRAL DISEASES:

[1] Bud Blight (Tobacco Ringspot Virus)

[1] Yellow Mosaic (Bean Yellow Mosaic Virus)

★ [1] Cowpea Mosaic (Cowpea Chlorotic Virus)

[1] Pod Mottle (Bean Pod Mottle Virus)

★ [1] Seed Mottle (Soybean Mosaic Virus)

NEMATODE DISEASES:

Soybean Cyst Nematode *(Heterodera glycines)*

★ [0] Race 1 [0] Race 2 [1] Race 3 [0] Race 4 [ ] Other *(Specify)* _____

[0] Lance Nematode *(Hoplolaimus Colombus)*

★ [0] Southern Root Knot Nematode *(Meloidogyne incognita)*

★ [0] Northern Root Knot Nematode *(Meloidogyne Hapla)*

[0] Peanut Root Knot Nematode *(Meloidogyne arenaria)*

[0] Reniform Nematode *(Rotylenchulus reniformis)*

[1] OTHER DISEASE NOT ON FORM *(Specify)*: White Mold (Sclerotinia sclerotiorum)

20. PHYSIOLOGICAL RESPONSES: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

★ [2] Iron Chlorosis on Calcareous Soil Score = 7

[ ] Other *(Specify)* _____

21. INSECT REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

[0] Mexican Bean Beetle *(Epilachna varivestis)*

[0] Potato Leaf Hopper *(Empoasca fabae)*

[ ] Other *(Specify)* _____

22. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED.

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant Shape	9162	Seed Coat Luster	9162
Leaf Shape	L2233	Seed Size	S1990
Leaf Color	9162	Seed Shape	9162
Leaf Size	L2233	Seedling Pigmentation	9162

23. GIVE DATA FOR SUBMITTED AND SIMILAR STANDARD VARIETY: Paired Comparison Data

9600052

VARIETY	NO. OF DAYS MATURITY	PLANT LODGING SCORE	CM PLANT HEIGHT	LEAFLET SIZE		SEED CONTENT		SEED SIZE G/100 SEEDS	NO. SEEDS/ POD
				CM Width	CM Length	% Protein	% Oil		
9153 Submitted	131	1.6	77	8.3	12.3	40.6	23.9	22.2	3
A1662 Name of Similar Variety	130	2.2	89	8.7	13.3	43.4	22.0	22.0	3

PUBLICATIONS USEFUL AS REFERENCE AIDS FOR COMPLETING THIS FORM:

1. Caldwell, B.E., ed. 1973. Soybeans: Improvement, Production, and Uses. Amer. Soc. Agron. Monograph No. 16.
2. Buttery, B.R. and R.I. Buzzell. 1968. Peroxidase activity in seeds of soybean varieties. Crop Sci., 8: 722-725.
3. Hymowitz, T. 1973. Electrophoretic analysis of SBTI-A_2 in the USDA soybean germplasm collection. Crop Sci., 13: 420-421.
4. Payne, R.C. and L.F. Morris. 1976. Differentiation of soybean cultivars by seedling pigmentation patterns. J. Seed Technol. 1: 1-19.

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9600052

9151 PVP Application

EXHIBIT D.

In Exhibit C we have identified 9151 as susceptible to bacterial blight, brown spot, pod and stem blight, rhizoctonia root rot, bud blight, yellow mosaic, cowpea mosaic, pod mottle and seed mottle. This does not mean we consider 9151 to be worse than other varieties of similar maturity in reaction to these challenges. Rather, we have chosen to be conservative and have identified 9151 as "susceptible".

Variety 9151 is a mid group I variety. If group I maturities are divided into tenths, the relative maturity of 9151 is 1.5.

Pioneer Hi-Bred Int'l, Inc.
PVP Application 9151 Soybean
May 2, 1995

EXHIBIT E: STATEMENT OF THE BASIS OF APPLICANT'S OWNERSHIP

Variety '9151' was originated and developed by plant breeders (U.S. nationals) from whom, by agreement, Pioneer Hi-Bred has obtained exclusive rights to protect and market variety '9151'. No rights to such invention, discovery, or development are retained by the plant breeders or by any other party.